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## (54) LAMINATED BODY

### (57)Abstract:

PROBLEM TO BE SOLVED: To provide a laminated body with excellent flexibility and stretchability being suitable for uses such as clothes, leather-like sheets and hygienic materials.

SOLUTION: The laminated body manufactured by laminating at least one kind of sheet selected from a group consisting of woven and knitted fabrics, nonwoven fabrics, films and scrims on one face or both faces of a sheet-like article consisting of a polyolefin elastomer is provided.

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(54) Title of the Invention

Liquid holding container and liquid holding bag, supported therein

(57) [Abstract]

[Object]

In structures of a liquid holding bag and a container supporting a plurality of bags, it is attempted to improve liquid holding efficiency as to a size of the liquid holding container and to reduce size of the holding container.

[Means for Solution]

An ink holding bag 1 is structured in that two sheets are piled, and respective end parts 1a, 1b, 1c, 1d of peripheral four sides are deposited to seal, and one end part 1d being one of the four sides is provided with a spout member 2 for turning on the ink. The spout members 2 have convexes 3 in the side peripheries for mounting on concave-shaped fixtures 4a, 5a (partially not shown) formed in cases 4, 5, so that the ink bag 1 is firmly supported within the cases 4, 5. When supporting, the ink bag 1 is tilted by a predetermined angle  $\alpha$  with respect to the cases 4, 5 by means of the convex 3 of the spout member 2, the concave-shaped fixtures 4a, 5a formed in the cases 4, 5, and ribs 4c, 5c.

## [Claims]

## [Claim 1]

A liquid holding container, structured with bags and cases, said bag formed by piling sheets to be substantially square, and bonding non-connected parts in peripheries of the sheets to form a liquid holding portion enabling to hold the liquid in an interior thereof, and having a spout member for taking on the liquid outside at one part of the peripheries of the liquid holding portion, and said cases supporting a plurality of bags therein and having holes exposing outside the spout members only,

characterized in that the plurality of bags are supported within the cases in a manner of piling the liquid holding portions in the vicinity of the bonded parts without having the spout members in the peripheries of the bags.

## [Claim 2]

The liquid holding container as set forth in claim 1, wherein a convex portion is provided integrally with the case for supporting the bag in the interior of the case, said bag tilting by a predetermined angle around rotating center of the spout member.

## [Claim 3]

A liquid holding bag, supported in the liquid holding container set forth in claim 1, wherein two sides or more of the square four sides are sealed.

## [Claim 4]

A liquid holding container, structured with bags and cases, said bag formed by piling sheets to be substantially square, and bonding non-connected parts in peripheries of the sheets to form a liquid holding portion enabling to hold the liquid in an interior thereof, and having a spout member for taking on the liquid outside at one part of the peripheries of the liquid holding portion, and said cases supporting a plurality of bags therein and having holes exposing outside the spout members only,

characterized in that the bag is provided at the spout member thereof with a convex portion, fixtures are provided at the interior of the case for mounting on the convex portions

in order to firmly support the bag to the case, the bag is firmly supported to the case in the interior of the case by said mounting between the convex portions and the fixtures, said bag tilting by a predetermined angle around rotating center of the spout member.

[Claim 5]

A liquid holding bag, supported in the liquid holding container set forth in claim 4, wherein a convex portion of a spout member of the bag is formed to be rectangular in an external shape, and when supporting the bag in the case, the bag is tilted at the same angle as said predetermined angle with respect to the plane of the bag under a condition where no liquid is held therein.

[Claim 6]

A liquid holding bag, supported in the liquid holding container set forth in claim 4, wherein two sides or more of the square four sides are sealed.

[Claim 7]

A liquid holding bag, formed by piling sheets to be substantially square, and bonding non-connected parts in peripheries of the sheets to form a liquid holding portion enabling to hold the liquid in an interior thereof, and having a spout member for taking on the liquid outside at one part of the peripheries of the liquid holding portion,

characterized in that a plurality of bags are connected in the vicinity of the bonded parts without having the spout members in the peripheries of the bags, and the width of the connected part is 1/2 or more than the width of the liquid holding portion of said bag.

[Claim 8]

The liquid holding bag as set forth in claim 7, wherein two sides or more of the square four sides are sealed.

[Detailed Description of the Invention]

[0001]

[Technical Field to which the Invention belongs]

The present invention relates to a liquid holding bag and

cases supporting a plurality of bags, and in particular an ink tank used to a printer, in which bags holding an ink of liquid state are supported in the cases.

[0002]

[Prior Art]

As an embodiment of the ink tank of an ink jet printer which spouts ink droplets on a medium as paper for printing, there is a bag-like ink tank made by pasting sheet shaped members. The bag supports the ink as liquid, and therefore an ink holding efficiency is excellent.

[0003]

Fig. 10 is a disassembled perspective view showing one example of such formed ink tanks. An ink bag 101 holding an ink is structured in that two sheets are piled (or one sheet is folded), and end parts 101a, 101b, 101c, 101d of peripheral four sides are sealed by deposit, and one end 101d as one of the four sides is provided with a spout member 102 for turning on the ink. The spout members 102 have convexes 103 in peripheries for mounting on fixtures 104a, 105a (partially not shown) shaped in concave furnished with the ink bag 101 in cases 104, 105 so that the ink bag 101 is secured in the cases 104, 105. The bag 101 holds the ink as liquid, and is easily crushed. Therefore, for handling, the ink bag 101 is generally supported in the cases 104, 105 exclusively used. The cases 104, 105 are respectively formed with holes 104b, 105b for exposing the spout members 102 outside. Under this condition, the cases 104, 105 mount each other by locking means (not shown), and are made a unit as an ink tank 106 supporting the ink bags 101.

[0004]

Fig. 11 is a cross sectional view along a - a line of Fig. 10 of the unit-made ink tank 106. Since the respective ends of the peripheral four sides of the ink bag 101 are deposited as mentioned above, a central part 101e in cross section is ready for swelling under a condition of holding the ink 107 (oblique lines), and as coming nearer to the ends 101b, 101c, the swelling becomes smaller. Further, the plurality of ink bags 101 are

arranged as shown in series with respect to the cases 104, 105, and for example, for supporting the two ink bags 101, the ink tank 106 necessitated such a width b including an amount of widths of at least two ink bags 101 and margins thereof.

[0005]

[Problems that the Invention is to solve]

However, in this arrangement, the width d of the amount supporting the width of the central part 101e of the ink tank 101 is required allover range of the width b of the ink tank 106. Accordingly, in the tank, there exist spaces shown with lattices 108 in Fig. 11, that is, dead spaces which are made in that the swellings of the ink bags 101 become smaller toward the lines 101b, 101c, and comparing with the size of the ink tank 106, the amount of the ink 107 is small, in short, an ink holding efficiency is reduced.

[0006]

This matter causes influences to other parts by increasing the size of ink tank 106, and finally raises a problem of large size of the printer main body.

[0007]

In view of the above mentioned problems involved with the prior art, it is an object of the invention to provide a shape of and a holding structure of the ink bag to be supported in the ink tank, heightening the ink holding efficiency with respect to the size of the ink tank, and reducing in size the ink tank and in turn the printer main body.

[0008]

[Means for solving the Problems]

For accomplishing the above mentioned object, a first invention is concerned with a liquid holding container which is structured with bags and cases, said bag formed by piling sheets to be substantially square, and bonding non-connected parts in peripheries of the sheets to form a liquid holding portion enabling to hold the liquid in an interior thereof, and having a spout member for taking on the liquid outside at one part of the peripheries of the liquid holding portion, and said cases

supporting a plurality of bags therein and having holes exposing outside the spout members only, and the above mentioned liquid holding container is characterized in that the plurality of bags are supported within the cases in a manner of piling the liquid holding portions in the vicinity of the bonded parts without having the spout members in the peripheries of the bags.

[0009]

In this case, it is preferable that a convex portion is provided integrally with the case for supporting the bag in the interior of the case, said bag tilting by a predetermined angle around rotating center of the spout member. Such a bag supported in the liquid holding container is preferably a liquid holding bag where two sides or more of the square four sides are sealed.

[0010]

According to the above first invention, in the structure which supports in the cases a plurality of bags, said bag formed by piling sheets to be substantially square and bonding non-connected parts in peripheries of the sheets to form a liquid holding portion enabling to hold the liquid in an interior thereof, and having a spout member for taking on the liquid outside at one part of the peripheries of the liquid holding portion, since the plurality of bags are supported within the cases in a manner of piling the liquid holding portions in the vicinity of the bonded parts without having the spout members in the peripheries of the bags, that is to say, piling parts of the bags with less swelling, it is possible to reduce the size of the cases being the externals of the liquid holding container.

[0011]

Further, a second invention is concerned with a liquid holding container which is structured with bags and cases, said bag formed by piling sheets to be substantially square, and bonding non-connected parts in peripheries of the sheets to form a liquid holding portion enabling to hold the liquid in an interior thereof, and having a spout member for taking on the liquid outside at one part of the peripheries of the liquid holding portion,

and said cases supporting a plurality of bags therein and having holes exposing outside the spout members only, and the above mentioned liquid holding container is characterized in that the bag is provided at the spout member thereof with a convex portion, fixtures are provided at the interior of the case for mounting on the convex portions in order to firmly support the bag to the case, the bag is firmly supported to the case in the interior of the case by said mounting between the convex portions and the fixtures, said bag tilting by a predetermined angle around rotating center of the spout member.

[0012]

The bag supported in the liquid holding container has the convex portion of the spout member formed to be rectangular in an external shape, and when supporting the bag in the case, desirably the bag is tilted at the same angle as said predetermined angle with respect to the plane of the bag under a condition where no liquid is held therein. In addition, the liquid holding bag supported in the liquid holding container as mentioned above is applied with such a liquid holding bag sealed at two sides or more of the square four sides.

[0013]

According to the above second invention, the fixing convex portion provided at the spout member of the liquid holding bag is tilted at the predetermined angle with respect to the plane of the bag along a maximum cross sectional area of the liquid holding bag, such that, when supporting the bag in the case, the liquid holding bag is supported tilting around rotating center of the spout member. Furthermore, by providing the convex portions within the cases for pressing one ends of the supported liquid holding bags to the interiors of the cases, the mutually piling end parts of the respective liquid holding bags approach to the interiors of the cases, so that spaces within the cases occupied by the liquid holding bags are usefully used to enable to lessen dead spaces.

[0014]

A third invention is concerned with a liquid holding bag

formed by piling sheets to be substantially square, and bonding non-connected parts in peripheries of the sheets to form a liquid holding portion enabling to hold the liquid in an interior thereof, and having a spout member for taking on the liquid outside at one part of the peripheries of the liquid holding portion, and the above bag is characterized in that a plurality of bags are connected in the vicinity of the bonded parts without having the spout members in the peripheries of the bags, and the width of the connected part is 1/2 or more than the width of the liquid holding portion of said bag. This liquid holding bag is desirably sealed at two sides or more of the square four sides.

[0015]

According to the above third invention, the plurality of bags are connected in the vicinity of the bonded parts without having the spout members in the peripheries of the bags, and the width of the connected part is 1/2 or more than the width of the liquid holding portion of the bag, whereby it is possible to provide such an easily manageable liquid holding bag enabling to create a condition where, folding one bag to pile, the end part of this bag does not contact the most swelling central part of a neighboring bag.

[0016]

[Mode for carrying out the Invention]

The following explanation will be made to embodiments of the invention, referring to the attached drawings.

[0017]

Fig. 1 shows a disassembled perspective view showing the ink tank according to one embodiment of the invention. In Fig. 1, the ink bag 1 holding an ink is structured in that two sheets are piled (or one sheet is folded), and end parts 1a, 1b, 1c, 1d of four sides are sealed by deposit, and one end 1d as one of the four sides is provided with a spout member 2 for turning on the ink. The spout members 2 have convexes 3 in peripheries for mounting on fixtures 4a, 5a (partially not shown) shaped in concave furnished with the ink bag 1 in cases 4, 5 so that the ink bag 1 is secured in the cases 4, 5. By the way, the

ink bag is sufficient with any flexible bag, and a liquid to be held is not limited to the ink.

[0018]

When securing, the ink bag 1 is tilted by a predetermined angle  $\alpha$  with respect to the cases 4, 5 by means of the convex 3 in the peripheries of the spout member 2, the fixtures 4a, 5a in concave formed in the cases 4, 5, and ribs 4c, 5c (details will be made later). The bag 1 holds the ink as liquid, and is easily crushed. Therefore, for handling, the ink bag 1 is generally supported in the cases 4, 5 exclusively used. The cases 4, 5 are respectively formed with holes 4b, 5b for exposing the spout members 2 outside. Under this condition, the cases 4, 5 mount each other by locking means (not shown), and are made a unit as an ink tank 6 supporting the ink bags 101.

[0019]

Fig. 2 is a see-through view seen from an arrow C shown in Fig. 1 of the unit-made ink tank 6. In Fig. 2, the convex portion 3 provided in the spout member 2 of the supported ink bag 1 is formed to be rectangular in an external shape. This rectangle is formed, tilting by the predetermined angle  $\alpha$  with respect to a line 1f shown with one dotted line combining both ends 1b, 1c of the ink bag 1 (the line 1f is almost equal to a plane along a maximum cross sectional area of the ink holding 1, or to a plane of an ink not holding bag 1). Therefore, when the cases 4, 5 are mounted to the fixtures 4a, 5a, the line 1f of the ink bag, i.e., the ink bag 1 is secured, tilting by the predetermined angle  $\alpha$  with respect to the central line 6a of the ink tank 6.

[0020]

The case 4 is provided integrally with a rib 4c being the convex portion, and if pressing the end 1b at a left side of the ink bag 1 in Fig. 2 to a bottom of the case 5, maintenance of the tilting condition of the ink bag 1 is assisted. Similarly, the case 5 is also provided integrally with a rib 5c being the convex portion, pressing a right side 7c of the other ink bag 7 in Fig. 2 to the case 4. Thereby, the ink bags 1, 7 are both

supported within the ink tank 6, tilting by the predetermined angle  $\alpha$  as shown. Incidentally, the ink bags 1, 7 have the same shape.

[0021]

Fig. 3 is a cross sectional view along A - A line of Fig. 1 of the unit-made ink tank 6. As mentioned above, the two ink bags 1, 7 are respectively piled at the end 1c (the right side end of the ink bag 1 in Fig. 3) and at the end 7b (the left side end of the ink bag 7 in Fig. 3), holding the ink 8 (oblique lines) and tilting by the predetermined angle  $\alpha$ . By tilting, both ends 1c, 7b come near to the inside of the cases 4, 5 at the piling part (at the central part 6b in Fig. 3), and it is seen that the space occupied by the ink bags 1, 7 in the ink tank 6 is usefully used to decrease a dead space. The above mentioned manner is possible to considerably reduce the width B of the ink tank 6 more than twice of the width C of the ink bags 1, 7.

[0022]

Piling of the ink bag is not limited to the two ink bags. For example, as seen in Figs. 4 and 5, it is easily assumed to pile the four ink bags 1. It is based fundamentally on such a consideration that, in areas making the dead spaces at both ends 1b, 1c of small swelling of the ink bag 1, the same parts 1b, 1c of other ink bags 1 are piled to make the dead space lesser.

[0023]

Fig. 6 is perspective views of forming the ink bag 1. The above mentioned explanation has referred to that the two sheets 19, 20 are piled to be almost square as shown in Fig. 6(c), the four sides 21a, 21b, 21c, 21d are sealed to form a space for holding the ink, and one of the four sides is provided with the spout member for turning on the ink outside.

[0024]

As another example of forming the ink bag, as shown in Fig. 6(a), in a cylindrical sheet 17 which is sealed at opening ends 17a, 17b, the swelling begins from the deposited part to the central part 17c, while the swelling is also kept at the

non-deposited two sides. Thus, as the above embodiment, the ink bags are piled in the tank case near the sealed ends 17a, 17b.

[0025]

Similarly, in a form shown in Fig. 6(b) of folding one sheet and sealing three sides, since the swelling in a non-sealed side 18d, i.e., in the folded part is large, the above embodiment is applied to any one of the sealed ends 18a, 18b, 18c.

[0026]

From the above mentioned, it may be said that since the swelling around the ends sealed by such as depositing is small, the dead space is easily created, but if parts near the ends are piled and supported within the tank case, the space is usefully used. By the way, it is possible to apply to this invention such an ink bag, two sides or more of four sides of which are sealed.

[0027]

(Other embodiments)

Fig. 7 is a perspective view showing the ink bag according to another embodiment.

[0028]

The ink bag 9 and the ink bag 10 shown in Fig. 7 are formed by sealing to connect respective one sides via a common depositing part in a producing process (other parts are of the same structure as the above embodiments, and explanations will be omitted).

[0029]

By folding the ink bag 10 at the deposited part as shown with an arrow, it is possible to easily make a form partially piled.

[0030]

Fig. 8 is cross sectional views of the ink bags 9, 10 connected as mentioned above. The width of the ink holding portion of the ink bags 9, 10 is D as shown in Fig. 8(a), and the width of the deposited portion between both is E. Herein, if folding the ink bag 10 as the arrow 12 at the part 13 connected with the deposited part 11, a form is as shown in Fig. 8(b).

If the relation between the width E of the deposited part 11 and the width D of the ink bags 9, 10 is

[0031]

[Formula 1]

$$0.5 \times D < E \quad (15),$$

it is possible to make a condition where the end 14 of the ink bag 14 does not reach the central portion 16, in short, it is possible to pile the ink bags without increasing the thickness F in the central portion 16 of the ink bag 9.

[0032]

Further, such folding as shown in Fig. 8(c) not necessitating the piling is available, and this is good in handling of plural and separate ink bags.

[0033]

Fig. 9 is cross sectional views of the ink bags show in Figs. 7 and 8. Depending on this figure, it is seen that the bag supporting conditions explained with Figs. 1 to 3 are realized similarly.

[0034]

The above mentioned two embodiments have been explained with the example of the bag-like ink tank used to the ink jet printer, and as far as the bag of holding not only the ink but also other liquids and the cases of supporting a plurality of such bags, the same effect may be apparently expected.

[0035]

[Effects of the Invention]

As explained above, according to the first invention, the bag is formed by piling sheets to be substantially square, and bonding non-connected parts in peripheries of the sheets to form a liquid holding portion enabling to hold the liquid in an interior thereof and having a spout member for taking on the liquid outside at one part of the peripheries of the liquid holding portion, and when supporting the plurality of bags in the cases, if the plurality of bags are supported within the cases in a manner of piling the liquid holding portions in the vicinity of the bonded parts without having the spout members

in the peripheries of the bags (that is to say, piling parts of the bags with less swelling), it is possible to reduce the size of the cases being the externals of the liquid holding container.

[0036]

According to the above second invention, the fixing convex portion provided at the spout member of the liquid holding bag is tilted at the predetermined angle with respect to the plane of the bag along a maximum cross sectional area of the liquid holding bag, such that, when supporting the bag in the case, the liquid holding bag is supported tilting around rotating center of the spout member. Furthermore, by providing the convex portions within the cases for pressing one ends of the supported liquid holding bags to the interiors of the cases, the mutually piling end parts of the respective liquid holding bags approach to the interiors of the cases, so that spaces within the cases occupied by the liquid holding bags are usefully used to enable to lessen dead spaces.

[0037]

According to the above third invention, in the liquid holding bags similarly to the first and second inventions, the plurality of bags are connected in the vicinity of the bonded parts without having the spout members in the peripheries of the bags, and the width of the connected part is 1/2 or more than the width of the liquid holding portion of the bag, whereby it is possible to provide such an easily manageable liquid holding bag enabling to create a condition where, folding one bag to pile, the end part of this bag does not contact the most swelling central part of a neighboring bag.

[Brief Description of the Drawings]

[Fig. 1]

A disassembled perspective view showing the ink tank according to one embodiment of the invention;

[Fig. 2]

A see-through view showing a condition of securing the ink bags in the ink tank according to one embodiment of the

invention;

[Fig. 3]

A cross sectional view showing a condition of supporting the ink bags within the ink tank according to one embodiment of the invention;

[Fig. 4]

A cross sectional view showing another example of piling the ink bags within the ink tank according to one embodiment of the invention;

[Fig. 5]

A cross sectional view showing a further example of piling the ink bags within the ink tank according to one embodiment of the invention;

[Fig. 6]

[Fig. 7]

A perspective view showing the ink bag according to another embodiment of the invention;

[Fig. 8]

Cross sectional views showing conditions of folding the ink bags according to a further embodiment of the invention;

[Fig. 9]

Cross sectional views showing a condition of supporting the ink bags within the case according to a still further embodiment of the invention;

[Fig. 10]

A disassembled perspective view showing the ink tank according to the prior art; and

[Fig. 11]

A cross sectional view showing the condition of supporting the ink bags within the ink tank according to the prior art.

[Description of the Reference Numerals]

1: Ink bag

1a, 1b, 1c, 1d: End parts

2: Spout member

3: Convex portion

4, 5: Cases

4a, 5a: Fixtures  
4b, 5b: Holes  
4c, 5c: Ribs (provided integrally with the cases)  
6: Ink tank  
6a: Central line  
6b: Central part  
7: Ink bag  
7a, 7b, 7c, 7d: End parts  
11: Deposited part (connecting a plurality of ink bags)  
12: Folding direction  
13: Connected part  
14: End part of the ink bag